

DOSING DISPENSER AND RESERVOIRBackground of the InventionField of the Invention

[0001] The invention relates to a dosing dispenser for dosing at least two components, wherein the dosing dispenser has a reservoir with at least two containers, which can be combined to form the reservoir and each of which can receive one component. The invention also relates to a reservoir for a dosing dispenser having at least two containers that can be combined to form the reservoir.

Description of the Related Art

[0002] Dosing dispensers for two or more components are known in the art in a wide variety of forms. The components to be dosed are located either in a reservoir divided into two compartments, or the two components are located in separate reservoirs, each of which is separately coupled to a dosing apparatus. United States Patent 5,848,732 of the applicant discloses a reservoir that is partitioned into two separate accommodation compartments, where the two components can be mutually dosed at a fixed quantitative ratio. This United States patent also shows an embodiment with two separate reservoirs that are connected to the dosing apparatus. Since the two reservoirs are fixed only by coupling them to the dosing apparatus in the dosing dispenser, the reservoir is often observed to shift in the dosing dispenser, making it somewhat unstable.

[0003] United States Patent 4,826,048 attempts to obviate this drawback by connecting the two reservoirs by a separate bridge. This bridge or shell is placed over the undersurface of the two reservoirs where it is fixed in an interference fit. This manner of connecting the two containers in the dosing dispenser has proven to be disadvantageous because the connecting bridge can fall off if the fit is not sufficiently accurate. A further drawback is that a plurality of different connecting bridges must be provided for different

reservoir shapes and sizes. Furthermore, additional effort is required to exchange the reservoirs.

Summary of the Invention

[0004] Thus, the object of the present invention is to provide a dosing dispenser with reservoir that obviates the described drawbacks. In particular, a dosing dispenser and reservoir are to be provided whose containers are configured separately but can be combined to form a reservoir in such a way that the containers are firmly and securely interconnected but can nevertheless be easily detached. Furthermore, production thereof is to be simplified and made more economical.

[0005] In one embodiment, the dosing dispenser for two or more components according to the invention has the following component parts. A reservoir with at least two containers is provided, in which the two components are disposed and which can be combined to form the reservoir. Furthermore, a pump unit may be provided for each container. The quantitative ratios of the two components may be adjustable by means of an adjusting element. In addition, a handle may be provided to actuate the pump units and a mixing nozzle to discharge the components.

[0006] According to one embodiment, the containers that can be combined to form the reservoir each have at least one engagement element in the area facing the bottom side of the container. Each engagement element comprises at least one projecting element and at least one corresponding recessed element. The engagement element of each container interacts with the engagement element of the other container so that the at least two containers can be combined to form the reservoir by inserting the projecting elements of each container into the recessed elements of the respectively other container. This configuration of the anchoring on the contact surfaces of the two containers with the aid of the protuberant, protruding or projecting element and the corresponding recessed element connects the containers to form a reservoir in a positive locking and stable manner. At the same time, the containers are nevertheless readily detachable.

[0007] Since, in one embodiment, the containers are fastened only in a partial area and not over the entire container length or height, they can easily be connected to form the

reservoir. Because the interconnection is provided in the area of the reservoir that is most remote from the pump and dosing unit, the overall stability of the dosing dispenser is at the same time substantially increased. A shifting of the containers, e.g., due to lateral pressure, is inhibited because the containers and thus the reservoir are interconnected to form a unit not only by the dosing device but also by the engagement elements. This positive locking anchoring can also be described as a tongue and groove joint or a bayonet joint. Likewise, the protruding element could also be described as a latching projection.

[0008] In addition to affording the advantage of simple yet secure combinability of the two containers, there are other advantages as well. Because of the manner in which the engagement elements are arranged on the contact surfaces of the containers according to the invention, it is sufficient to produce only a single container type, which based on the opposite connection is then complemented in mirror image. For example, if only one indentation were provided on one container and only one protruding element on the other, two different containers and molds would have to be produced to manufacture the reservoir according to the invention and thus the dosing dispenser. This would increase the production costs considerably. However, because one complete engagement element comprises a protruding element and a corresponding recessed element is provided on each container, it is sufficient to provide only a single container type, two (or more) of which can be connected to form a reservoir. This significantly reduces the production costs for a dosing dispenser and a reservoir according to the invention.

[0009] In one embodiment, both the indentation and the fixation projection are undercut, so that the interconnection of the two containers becomes especially secure. However, even without an undercut in the fixation projection and the corresponding indentation, the two containers are more securely interconnected than if these elements were absent. It should be noted that the undercut is a preferred embodiment but not a necessity.

[0010] The engagement elements can assume different shapes. In one embodiment the projections and indentations assume a dovetail shape, which can also be described as a trapezoidal shape. It is also possible to provide a cylindrical bead and a like slot into which the cylindrical bead can be inserted. Furthermore, instead of the cylindrical bead, a spherical shape may be provided, which can again be inserted and anchored in a

cylindrical indentation. Other shapes of protruding and recessed elements, including barb-type configurations, may also be provided. To be mentioned are T-shaped and L-shaped projections and indentations.

[0011] In one embodiment, the engagement elements are centered relative to the vertical axis of the container. Even an eccentric arrangement, however, does not impair the effect and function of the engagement elements according to the invention. Furthermore, at least the recessed elements—and in this case also the protruding elements—of the engagement element can extend over the entire container height. This would achieve an even more stable engagement of the two containers, i.e., it would further improve the stability of the anchoring.

[0012] In one embodiment, the reservoir according to the invention is made of a plastic material, which is can be formed by blow molding. Especially when the blow molding process is used, it is important that the reservoirs produced can be easily removed from the mold, without the mold having to be disassembled into many individual parts or long mold slides having to be provided to remove the reservoirs from the mold. This is ensured specifically by the configuration of the engagement elements according to the invention and the reservoirs per se. As a result the mold is compact and simple. In addition, the production cycle times are reduced. This, too, lowers the production costs for the reservoirs and thus for the dosing dispenser as a whole. This, however, is a prerequisite for the dosing dispenser to be used in a wide range of applications, e.g., in cosmetics.

Brief Description of the Drawings

[0013] The invention will now be explained and described in greater detail with reference to the drawings in which

[0014] FIG 1 is a side view of an embodiment of a reservoir;

[0015] FIG 2 is a side view of the reservoir shown in FIG 1 divided into two containers;

[0016] FIG 3 is a bottom view of the two containers depicted in FIG 2;

[0017] FIG 4 is a bottom view of the containers depicted in FIG 3, combined to form the reservoir;

[0018] FIG 5 is a perspective view of an embodiment of a container;
[0019] FIG 6 is another perspective view of the container depicted in FIG 5;
[0020] FIG 7 is a longitudinal section of the container shown in FIG 5 and 6;
[0021] FIG 8 is a bottom view of the container shown in FIG 5 and 6;
[0022] FIG 9 depicts bottom views of additional embodiments of a container;
[0023] FIG 10 shows bottom views of yet other embodiments of the container;
[0024] FIG 11 is a bottom view of yet another embodiment of the container;
[0025] FIG 12 is a bottom view of yet another embodiment of the container;
[0026] FIG 13 is a bottom view of another embodiment of a reservoir (A) and an individual container (B) thereof; and
[0027] FIG 14 is a bottom view of yet another embodiment of a reservoir (A) and an individual container (B) thereof.

Detailed Description of the Preferred Embodiment

[0028] FIG 1 shows one embodiment of a reservoir 1 comprising two separate containers 10 and 30. The two containers 10 and 30 are interconnected via an engagement element 50, which is only outlined here. Each of the containers 10 and 30 is hollow on the inside and accommodates one of the components to be dosed by means of the dosing dispenser. Pump units (not depicted), inserted into the interior of the containers 10 and 30 and conveying the components, can be connected to the fittings 11 and 31 of the containers 10 and 30. To fasten them securely, threads or, as shown in FIG 1, webs 12 and 32 are provided. The reservoir 1 of FIG 1 further has a projection in its upper region, which in the case of containers 10 and 30 is identified by reference numerals 13 and 33. The dosing unit (not depicted in FIG 1) sits on these projections.

[0029] FIG 2 shows the reservoir 1 of FIG 1 separated into the two containers 10 and 30. A smaller scale than in FIG 1, however, has been selected for this representation. FIG 2 depicts a side view of the containers 10 and 30 showing the contact surfaces 14 and 34. FIG 1 on the other hand depicts a view of the containers 10 and 30 rotated by 90°. In the representation of FIG 1 the contact surfaces 14 and 34 of the containers 10 and 30 are facing one another in the center plane of the reservoir 1 thus formed. The connection 50 is

established by interlocking the engagement elements 15 and 35. Each engagement element 15 and 35 of the containers 10 and 30 has a projecting element 16 or 36 and a recessed element 17 or 37. To facilitate insertion of the projecting elements 16 and 36 into the corresponding recesses 37 and 17, an insertion area 18 or 38 with sloping walls 19 and 39 is preferably provided. FIG 2 also shows that, in this embodiment, the engagement elements 15 and 35 are provided in the lower region, e.g. in the bottom region of the containers 10 and 30. As a result, the projecting element 16 or 36 only needs to be inserted over a small distance into the recessed elements 17 or 37. This makes it substantially easier to thread in and connect the two containers.

[0030] The bottom views of FIG 3 and 4 illustrate the interlocking of the containers 10 and 30 or their engagement elements 15 and 35. The bottom sides 20 and 40 of the containers 10 and 30 are shown. The bottom views of FIG 3 and 4 clearly show that the projecting elements 16 and 36 protrude over the contact surfaces 14 and 34, while the recessed elements 17 and 37 are sunk into the contact surfaces 14 and 34. When the containers 10 and 30 are combined to form the reservoir, the contact surfaces 14 and 34 are facing one another, indicated by arrows 60 and 61. The projecting elements 16 and 36 are then inserted into the corresponding recessed elements 37 and 17. In other words, the projecting element 16 of the container 10 is inserted into the recessed element 37 of the container 30 and conversely, the projecting element 36 on the container 30 is inserted into the recess 17 of the container 10.

[0031] The embodiments illustrated in FIG 3 and 4 further show that both the projecting element 16 or 36 and the recessed element 17 or 37 have an undercut to ensure particularly stable meshing of the engagement elements 15 and 35. FIG 2 and 3 also show that the two containers 10 and 30 are configured substantially identically and can thus be exchanged as desired. Because each of the containers 10 and 30 has both a projecting element 16 or 36 and a recessed element 17 or 37, only a single container type has to be produced.

[0032] FIG 1–4 show a geometric example of a reservoir 1 according to the invention. The reservoir 1 as a whole preferably has a cylindrical shape, for which the two containers 10 and 30 complement each other. The containers 10 and 30 shown in the embodiment of FIG 1–4 have approximately the shape of cylinder halves, resulting in

semicircles in the bottom views. The reservoir 1 is divided approximately equally into the two containers 10 and 30, making possible the identity of the containers 10 and 30. Depending on the type of application, however, it may be advantageous to configure the containers 10 and 30 in different sizes. This would also make it possible to divide them in a different ratio, e.g., 2:1, 3:1 or 4:1. Furthermore, the shape of the reservoir 1 according to the invention can differ from that of a circular cylinder and in particular may be a square, a pyramid or an oval cylinder. The two containers 10 and 30 are divided accordingly.

[0033] FIG 5–8 show a further embodiment of a container 110 that can be combined with another like container to form a reservoir. The perspective views depicted in FIG 5 and 6 show the container 110 in such a way that the peripheral surface 121 (FIG 5) and the contact surface 114 (FIG 6) are visible. Also shown is the projection 113 on which the dosing apparatus is placed. The dosing head is placed on the fitting 111, with the webs 112 providing the anchoring. The components are located in the interior 123 of the hollow container 110. The engagement element 125 is shown particularly clearly in FIG 6. A projecting element 116 and a recessed element 117 are provided. In the embodiment shown in FIG 5 and 6, the engagement element 125 is again provided in the bottom region of the container 110. In contrast to the embodiment of FIG 1–4, however, it extends to approximately half the height of the container 110. The height of the projecting element 116 is smaller than the depth of the recessed element 117 because an insertion area 118 is formed in the recessed element 117 into which the projecting element 116 of another container 110 is inserted to provide the anchoring. A projecting element 116 is introduced into the insertion area 118 of another container 110 and moved downwardly, so that the projecting element 116 is threaded into the recessed area 117 of another container 110. To facilitate insertion of the projecting element 116, the insertion region 118 has sloped walls 119. In the embodiment shown in FIG 7, the slope is e.g., 45°. FIG 8 further shows an embodiment wherein both the projecting element 116 and the recessed element 117 are undercut at a 60° angle.

[0034] FIG 9–12 each shows a bottom view of containers with different configurations of the engagement elements. Accordingly, the illustrations depicted in FIG 9–12 represent embodiments of the engagement elements. FIG 9 depicts the containers 210 (A), 220 (B) as seen from the bottom side 211 or 221. The figure clearly shows that the projecting

element 216 or 226 protrudes over the contact surface 214 or 224 and the recessed element 217 or 227 is set back relative to the contact surface 214 or 224. The embodiments of FIG 9 show engagement elements meshing in dovetail configuration. Consequently, both the projecting element and the recessed element are undercut. FIG 9A shows the projecting element 216 and the recessed element 217 immediately adjacent to one another, whereas in the embodiment of FIG 9B the projecting element 226 and the recessed element 227 are spaced at a distance from one another.

[0035] FIG 10 shows a container 230 (A) and a container 240 (B). Here, too, views of the bottom sides 231 or 241 are shown. The engagement elements depicted in the embodiment of FIG 10 are rounded. The recessed elements 237 or 247 have the shape of a cylinder. The projecting elements 236, 246 can also have the shape of a cylinder. However, it is also provided that the projecting elements 236, 246 can have approximately the shape of a sphere whereby the projecting element 236, 246 can likewise be anchored in the recessed element 237 or 247. FIG 10A shows the recessed element 237 and the projecting element 236 directly adjacent to one another, whereas in FIG 10B the recessed element 247 and the projecting element 246 are spaced at a distance from one another. FIG 10 further shows the contact surfaces 234 and 244.

[0036] FIG 11 shows yet another embodiment of a container 250. The figure again depicts a view of the bottom side 251, wherein the contact surface 254 is also shown. The engagement elements in the embodiment of FIG 11 are L-shaped. Both the projecting element 256 and the recessed element 257 each have a barb 255 and 258 to provide a secure mutual anchoring of two containers 250. FIG 12 finally shows an embodiment with two barbs 265, 268. The figure again shows a view of the bottom side 261 of the container 260. The projecting element 266 and the recessed element 267 each have a T-shaped configuration. When two containers 260 interlock, the barbs 265 engage with the barbs 268. The embodiment of FIG 9–12 illustrates that the projecting elements and the recessed elements can either be directly adjacent to or spaced apart from one another. The figure further shows that the positions of the projecting and the recessed elements can be reversed (see, for example, FIG 9A and 10A).

[0037] FIG 13 and 14 further show embodiments of reservoirs 300 and 400 that comprise more than two containers. The figures depict the bottom sides of the containers. FIG 13A depicts a reservoir 300 comprising three containers 310, 320, 330. FIG 13B depicts an individual container 310. The containers 310, 320 and 330 are configured identically and interlock. Here, each of the containers 310, 320, 330 has two contact surfaces 314 and 315. When assembled, the contact surface 314 of the container 310 touches the contact surface of the container 320. In contrast, the contact surface 315 of the container 310 touches a contact surface of the container 330. This is clearly visible in FIG 13A where the container 310 is hatched to improve clarity. The container 310 now has a projecting element 316 on the contact surface 314. It furthermore has a recessed element 317 in the area of the contact surface 315. As may be seen in FIG 13A, the projecting element 316 now engages with the recessed element of the adjacent container 320. The projecting element 336 of the container 330, in turn, engages with the recessed element 317. This is similarly true for containers 320 and 330. Here the projecting element 326 of the container 320 engages with the recessed element of the container 330. The recessed elements of the containers 320 and 330 are not shown. Since the containers 310, 320 and 330 are configured substantially identically, however, their form and shape are evident from FIG 13B.

[0038] FIG 14 shows a reservoir 400 that comprises four separate individual containers 410, 420, 430 and 440. Here, too, it should be noted that the individual containers 410–414 are configured identically. FIG 14B shows a container 410, which is hatched in FIG 14A. FIG 14 depicts the bottom side of the reservoir 400 and the container 410. The container 410 has two contact surfaces 414, 415. A projecting element 416 is disposed on the contact surface 414, while a recessed element 417 is provided on the contact surface 415. For the sake of clarity, FIG 14A again shows only the projecting elements 416, 426, 436, 446. FIG 14A clearly illustrates how the individual containers 410–440 engage with one another.